

ABSTRACT

A method for manufacturing the memory device by plasma decomposition of sulfur dioxide. A first copper electrode having a surface is provided. The surface of the first copper electrode may be made amorphous. A copper sulfide layer, Cu_xS ,
5 where $1 \leq x \leq 2$, is disposed on the copper surface by decomposing sulfur dioxide in an ambient containing excess hydrogen. The copper sulfide layer may be is cuprous sulfide or cupric sulfide. A second copper electrode is coupled to the copper sulfide layer.